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ABSTRACT

Recognizing the need for some form of evaluation of students' ability to understand the organization of ideas in different subject areas, a study was conducted to evaluate 450 paragraphs written by students aged 12 to 17. Students chose one of three groups of four words each to write on. Each group represented a category, the subjects being vehicles, shelter, and emotion. The student was asked to select the word which could be a heading for the other three and use that word as a basis for the first sentence of a paragraph. The three other words were then to be used as a basis for three more sentences to complete the paragraph. Results supported the hypothesis that the proportion of students choosing the correct superordinate word in each word group would increase from the youngest to the oldest class. Results did not prove, however, that girls would choose the correct superordinate word more often than boys. Results also indicated a significantly larger proportion of students in the two youngest classes writing narrative paragraphs and using the first person than in the older four classes. The study concluded that further research is needed to establish relationships between reading and the ability to understand the organization of ideas when reading. A five-page bibliography is appended. (HOD)

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The secondary student's approach to expository text processing: a preliminary study of written paragraphs based on a four-word category.

Paper presented at the United Kingdom Reading Association Annual Conference, Reading 1985.

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ABSTRACT

Paragraphs divide text into groups of ideas and form the building materials of text. Students need to apply basic information processing strategies to them, whether they are reading or writing. Meaning has to be created by finding or expressing the paragraph's main significance and supporting information.

Secondary students have to process expository text rather than stories for school tasks, yet many do not know how to do it. Classroom teachers need a practical way of evaluating the ability of students to process groups of ideas which also provides guidance for instruction.

The study of 450 paragraphs written by students aged 12 to 17, based on four-word categories, is preliminary to a series of studies devoted to filling this need.

Secondary teachers know when their students are unable to do the reading and writing tasks demanded of them, but they may not understand that there can be an underlying cause: an ignorance of how ideas are grouped in text.

Regardless of the subject matter being taught, ideas are grouped by categories, classes, or sets and hierarchies of these. For science and mathematics teachers, the instructional significance of this is obvious, but that is not so for language and history teachers, for example. They are themselves familiar with hierarchies of ideas and it is hard to realize that students may not even see ideas as belonging in groups, but try to deal with them one by one. Neither comprehension nor memory can operate without an understanding of underlying relationships. The most basic of these is the category, or superordinate/subordinate relationship.

Human beings are born with the ability to select the information they attend to, at least up to a point, and the ability to group and code the information in memory. Without this, the brain would be swamped with random sensory impressions and no one would be able to learn from experience or predict likely occurrencies. Students, therefore, do have the basic competence of grouping and coding experience, although they are largely unaware of it.

In order for the skill to be useful for school tasks, it needs to be understood, consciously applied, and practised on the different kinds of information to be processed.

Processing a paragraph, whether during reading or writing activities, means to find or express a main idea and understand the logical ordering of subordinate points. In other words, in a large proportion of paragraphs to be found in secondary instruction, it means finding the category label and the items whose common attributes have been expressed by the label. The topic sentence is the elaborated equivalent of the category label. In other instances, the reader or writer must infer,or create the possibility of inferring,the generalization. This too can be done with reference to the category organization by listing the items and looking for the common attributes. The organization of many paragraphs, then, has much in common with category structure.

Two additional points need to be made before describing a study of written paragraphs based on categories. The first is that students in secondary classes may not yet have reached a necessary degree of maturity or have accumulated enough concepts to deal with abstract material. The second is that many of the present testing programmes in secondary schools do not have much practical value for teachers and that there is a real need for some form of evaluation, especially of student ability to understand the organization of ideas in different subject areas.

While Vygotsky, Piaget, and Bruner have differences of opinion about other aspects of development, the progression of students in the secondary years from reliance on the concrete world of actual experience towards a universe of abstract ideas expressed symbolically is accepted. A number of studies, such as Lawson's (Lawson, 1973, Lawson and Blake, 1976, and Lawson and Wollman, 1976), indicate that even in the final school years many students have not yet reached a stage of abstract, formal thinking. Matorano (1974) reviewed a number of studies of adults showing that even among that population this stage has often not been reached. Therefore, a number of tasks demanded of students cannot be successfully completed without a program of assistance.

Progress is aided or impeded by social, educational, and emotional factors which determine not only the way of thinking, but also the intentions, goals, or mind sets of students. Language plays an ever-increasing role in all subject areas, including mathematics. Even the creation of one brief paragraph requires an astonishing coordination of skills and background information. Recent models, such as Hayes and Flower's (1980) or Martlew's (1983), are useful approaches to understanding the complexity of the writing process. Figure 1 is the authors' own view of factors affecting the writing of a structured paragraph.

[Insert Figure 1]

The question inevitably arises whether it is not too late to help students with basic information processing of abstract materials once they are in upper secondary classes. There is some evidence, such as the work of Klausmeier (1978), that portions of secondary populations are unlikely to progress beyond dealing with the concrete world. On the other hand, the work of Taba (1965), Feuerstein (1980), and followers of Pascual-Leone such as Scardamalia (1977), among many others, seems to indicate that a consistent training program can be successful, especially for those who have been kept in ignorance of systematic ways of thinking.

The second point mentioned was that present testing programmes on the secondary level are not of great practical value to the classroom teacher, especially if an evaluation of the ability to organize ideas in language, or understand such an organization, is needed. This study and the projected future studies are an attempt to begin filling this gap.

Description of the Study

The study was based on a structured paragraph test developed some years ago by Gerhard as a means of obtaining at least partial information about student thinking and language level. Students are asked to choose one of three groups of four words each to write on. Each group represents a category, the

subjects being vehicles, shelter, and emotions. The student is asked to select the word which could be a heading for the other three and use that word as a basis for the first sentence of a paragraph. The other three words are then to be used as a basis for three more sentences to complete the paragraph. For example, a word list such as

monkey
dog
mammals
whale

would call for a topic sentence based on mammals followed by a sentence on each of the specific animals.

The population for the study was a private suburban school near Washington, D.C. The sample was the entire school divided into six ~~class~~ levels; 7th through 12th grade in U.S. terms. This means students of approximately 12 to 17. There were 450 students, the smallest number on one level being the top class of 60 students. The largest class was the lowest with 86 students.

The students wrote the paragraphs in regular English classes as a preliminary to a possible remedial programme. The instructions were given both orally and in writing. Scoring was done by two graduate students who did not know each other, one male, one female, one black and one white. Their instructions were given in writing without special training time in order to simulate scoring by classroom teachers without training. The scoring was as follows:

Choice of the correct superordinate word (scoring of either 0 or 5)	5
Writing of an appropriate topic sentence in terms of generalizing about the three items (scoring 0 or 2)	2
Use of logical order, a number of different orders being acceptable	1
Writing so that the paragraph makes sense, even if it follows a pattern other than that called for	1
Writing on a level of maturity which could be expected at a given age	1
Total	10

The interrater reliability of the two scorers was .75.

In addition to the above simple scoring system, the investigators also noted whether students wrote a narrative rather than expository paragraph, used the first person, and used at least one complex sentence. Number of boys and girls writing about each of the three subjects on each class level and their success at writing a structured paragraph was also noted.

The results of the study are presented in Figures 2-5. Figure 2 shows the percentage of students on each class level who chose the correct superordinate word. Figure 3 sorts the three subjects written on by boys and girls by class level and the percentage of those who chose the correct superordinate word. Figure 4 shows the percentage of students on each level who wrote a narrative rather than expository paragraph and those who used the first person. Figure 5 summarizes the

percentage on each grade level who wrote at least one complex sentence and the relationship of this to choice of the correct superordinate word.

Discussion of the Study

This study has certain limitations which must be dealt with at the outset. It is descriptive and exploratory, the population of suburban middle class students prevents any generalization to secondary students as a whole, there is no random sampling, and clearly the paragraph test is not a good indicator of the capacity of students to write a sophisticated paragraph or longer passages. Results may also be distorted because of inability of students to follow directions rather than inability to write a paragraph. That this is the case in other populations the authors have had opportunities to observe. Future studies should include an ethnographic follow-up with extensive interviews.

There is also a danger in stressing the writing of structured expository paragraphs. Britton and his colleagues (1975) have shown how limiting writing only for teacher evaluation can be. Especially in adolescence, students need opportunities for working through their personal experiences. The paragraph test was developed in the hopes that it would offer some guidance for helping students become competent at school tasks and prepare them for the kind of writing often associated with employment. It was not meant to stifle creativity and self expression.

All this being said, the results are not without interest. In Figure 2 the kind of dip or regression as students learn new ways of thinking which has been noted by a number of developmental psychologists such as Bruner's colleagues, Olver and Hornsby (1966), is seen in both the 8th and 11th grades. The original hypothesis was that the proportion of students choosing the correct superordinate word in each word group would increas from the youngest to the oldest class. This was substantiated if the classes are grouped by the three youngest and the three oldest. The difference was significant at the $p < .05$ level. However, there was not a linear progression.

[Insert Figure 2]

In line with a history of reports that girls are more competent with language than boys up until about the age of 16, the hypothesis was made that girls would choose the correct superordinate word more often than boys. This did not prove to be the case. However, a look at Figure 3 reveals a complex relationship between sex, age, and subject chosen as they affect correct choice. This result agrees with a number of studies which indicate that there is no monolithic writing ability, even for one individual. The type of task, the writer's perception of the audience, individual experience and schooling, familiarity with literature, and many other variables affect results.

[Insert Figure 3]

It was hypothesized that there would be a significantly larger proportion of students in the two youngest classes

writing narrative paragraphs and using the first person than in the older four classes. The hypothesis was based both on developmental grounds and the effect of schooling. The difference between the two groups illustrated in Figure 4 was highly significant at the $p<.001$ level for writing narrative paragraphs and significant at the $p<.05$ level for use of the first person. It should be noted that the use of the first person changed in the third class and above to forms such as "I believe" or "I think" rather than a personal narrative use such as "I saw" or "I did."

[Insert Figure 4]

Figure 5 is offered to show how much work remains to be done in this area of sentence structure. The way in which relationships are expressed is certainly relevant to a study of how students organize groups of ideas in language. However, detailed analysis must wait. A preliminary examination indicated that students in the two oldest classes used more sophisticated vocabulary and appropriate compound sentences than the younger students, often making complex sentences unnecessary. It was also interesting to note that in the 4th and 5th oldest classes, students sometimes used a higher level of superordination than the one provided; for example, writing about <u>transportation</u> rather than the given word <u>vehicles</u>. Clearly they understood which word was superordinate, but overshot the mark.

[Insert Figure 5]

In summary, results substantiate models showing writing as a highly complex process, even though the study was based on simple, short paragraphs only. There do also appear to be certain developmental trends, especially in regard to the use of expository rather than narrative form, which are probably affected by both development and schooling.

Future Plans

A teacher of reading will want to understand the relationship between ability to write a paragraph and ability to understand the organization of ideas when reading. One study, Lazdowski (1976), predicted reading grade levels accurately within one grade from writing samples from a range of ages. There has also been substantial work done on the relationship between reading and writing, such as Kintsch and Van Dijk (1978), Tierney and Pearson (1983), Stotsky (1983), and Wittrock (1983).

It seems only logical to assume that certain aspects of paragraph writing might indicate possible strengths or weaknesses in reading paragraphs. A lack of understanding of paragraph form, choice of a subordinate word as the main topic, lack of logical order, difficulty in expressing relationships, or use of limited vocabulary might well indicate related problems in reading. Further research is necessary to establish predictable relationships.

Studies looking at correlations between written paragraphs and standardized reading and intelligence tests are underway and await the accumulation of a sufficient number of samples. At one university reading center the paragraph test is included with each test battery administered. This center also uses the test as an indicator of the type of tutoring called for. An extensive checksheet for use with individuals has been found practical and could be used by classroom teachers interested in more than a quick scoring.

The cooperation of many people will be necessary to accumulate large numbers of paragraphs from different populations. Results may show that populations differ as to their place on a continuum of development, which would in turn call for different kinds of instruction.

Informal attempts to create bridges for students between the categorizing they do in daily life and that which they need to do to be successful in secondary classes have been going on for some years (Gerhard,1975). More recently, 20 teachers from one school were trained to use the process of categorizing to help their students think more systematically. The training included developing subject matter categories for writing-to-learn activities. Recent research as shown this, as well as carefully planned

reading, to be an effective tool (Bereiter,1980, Emig,1977, Fulwiler,1982, Newell,1984, and Shanklin,1982). In the coming year the progress of students in the classes of the trained teachers will be monitored through paragraph writing.

All of this is preliminary to setting up experimental studies using analysis of paragraphs written by students as a dependent variable in training programmes. This should be done in a variety of classes. One study, Gerhard (1983), seems to indicate that language and history teachers need some assistance in working with the categorizing process to improve comprehension, recall, and written expression.

(The authors wish to thank Marilyn Binkley, presently of The National Institute of Education, Washington, D.C., for assisting in obtaining the paragraph samples.)

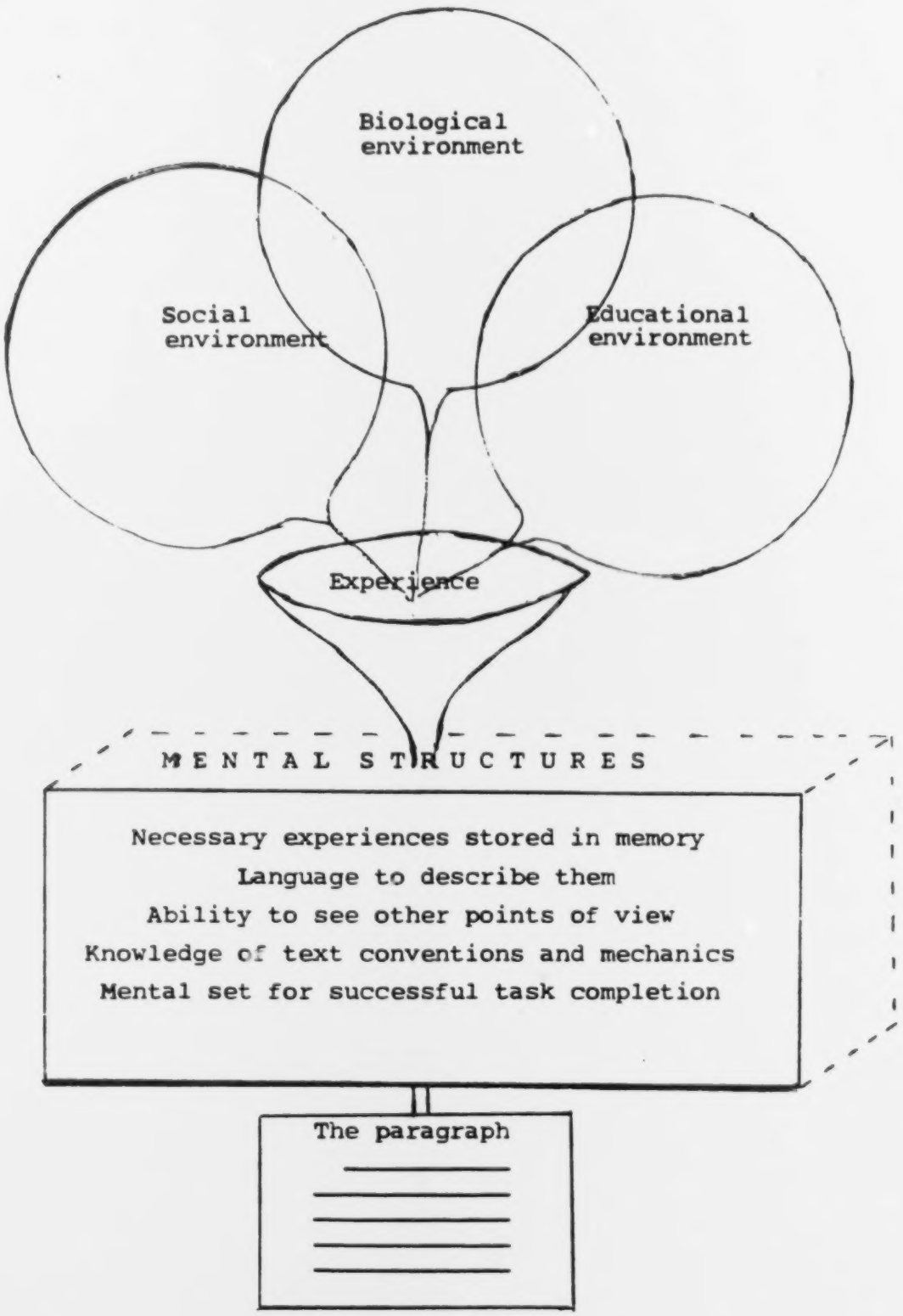

Figure 1. Factors affecting paragraph writing

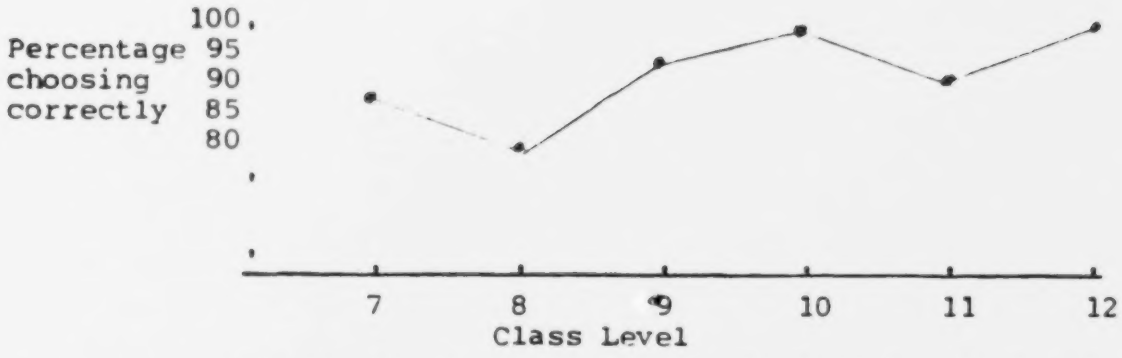

Figure 2. Percentage on each class level choosing the superordinate word correctly.

	Boys(n=46)	Girls(n=40)	Total(n=86)
	7th Grade		
Vehicles	13	11	12
Shelter	31	9	16
Emotions	--	--	--
	8th Grade		
	Boys(38)	Girls(36)	Total(74)
Vehicles	21	25	23
Shelter	36	6	20
Emotions	25	--	14
	9th Grade		
	Boys(49)	Girls(36)	Total(85)
Vehicles	10	--	8
Shelter	7	--	4
Emotions	--	10	9
	10th Grade		
	Boys(44)	Girls(32)	Total(76)
Vehicles	6	11	7
Shelter	--	--	--
Emotions	--	--	--
	11th Grade		
	Boys(38)	Girls(31)	Total (69)
Vehicles	18	13	17
Shelter	--	22	10
Emotions	--	7	6
	12th Grade		
	Boys(38)	Girls(22)	Total(60)
Vehicles	--	--	--
Shelter	--	--	--
Emotions	14	--	7

Figure 3. Percentage of girls and boys on each grade level who chose an incorrect superordinate word sorted by the category they chose to write on.

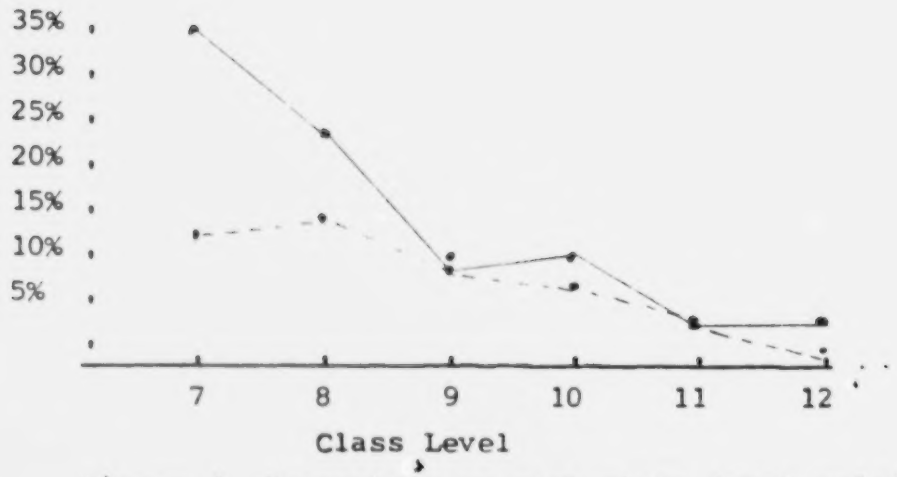

Figure 4. Percentage on each class level writing story paragraphs and using "I".

_____ writing stories

- - - using "I"

(Note: The use of "I" changed in the 10th class level to being predominantly included in "I think," "I believe" type of constructions)

Grade level	% writing complex sentences	% choosing correct superordinate word
7th	65	84
8th	45	69
9th	42	94
10th	75	93
11th	68	87
12th	43	95

Figure 5. Percentage of students writing complex sentences compared to choosing the correct superordinate word by grade level.

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